

Agenda - Separator Cavity Review May 4, 2001

Loft, Transfer Gallery, 2nd floor (East of X Gallery)

Note: there will be a site wide power outage 7:00am for 1/2 hr (we hope)

Hasan Padamsee, chair

Dominic Chan

Peter Kneisel

Dave Wildman

8:30-12:30

Introductory Remarks	John Marriner	1 0
Overview- and Schedule	Helen Edwards	1 5+5
Modified cav design and tuning model	Mike McAshan	2 5+5
Tuning, bead measurements; beam test plan	Leo Bellantoni	2 5+5
Warm Cavity Tuner design & tuning FEA	Allan Rowe	2 0+5

10:30 Coffee

2 0

VD Measurements 3GHz, 3.9 ?, vibration,

VD coupler, mag shielding	Mark Champion	2 5+5
Input coupler design considerations	Creig Deibele	2 0+5

12:15- 1:30

Working lunch & tour A0.

1:30-6:00

Multipacting calculations	Gennady Romanov	20+5
New structure welding/assembly/parts		
One cell, polarization issues		
Dumbell measurement fixt	Mike Foley	2 0+5
Cryo stat, Helium vessel, cold tuner, FEA,		
Hi Press system, & cryo plant review	Joel Fuerst	3 0+5
Thermometry	Moyses Kuchnir	2 0+5

3:20 Break

2 0

Summary, Budget, Questions

Helen Edwards 2 0+5

4:10-5:30

Committee closed session

5:30-6:00

Closeout- report recommendations

Kaon Separated Beam Superconducting RF Cavity R&D Review May 4, 2001

Background-

Two and a half years ago a conceptual design report was prepared and the 1st review of the Kaon Separated Beam Superconducting RF Cavity design took place. Since then effort on the project has proceeded at low priority. Engineering manpower has been officially assigned 11 months ago on a part time basis at the level of 3 fte's. Priorities in drafting, shop, and technician support have been low but are improving as preparation for the collider run is completed. Funding for FY01 M&S is 500K\$.

Since the 1st review considerable effort has gone into analysis and optimization of the cavity shape and studies of field flatness tuning. A new optimized shape geometry has been selected. Lorentz force calculations have been started. A 5 cell cavity of the original design shape has been fabricated, tuned and cold tested. A one cell cavity has now been tested twice. And a second 1 cell with side ports and helium vessel flanges is near the test stage. Fabrication of dumbbells for a 13 cell cavity and single cells of the new shape have been initiated. Vertical dewar cold tests of Cornell 3GHz cavities have been carried out but have not yielded particularly good Q vs E results. Vertical dewar couplers for 3.9 GHz have been assembled and to date 3 tests at 3.9GHz have been carried out. Model measurements for the side input coupler have been made and analysis of the expected coupling performed. A prototype coupler is under design. Prototype cryo vessel construction is well underway. A hi pressure rinsing system is in the commissioning phase. First cavity test after using the HPR has just been preformed. Design of a field flatness tuning fixture is complete and fabrication underway. The cold frequency tuner design work has started, but a specific design has not yet been selected. Work has not been started on a chemistry system but small parts can be etched in existing facilities and JLab has been very helpful with cavity preparation. An order for a prototype High Power RF system has not been placed to date.

The CKM experiment, the planned user of the beam, has been requested to submit a complete proposal, including design of the K beamline and relevant R&D (including the sc cavities) by April 1, 2001 and a schedule and cost estimate by June 2001. The PAC will address experiment approval in June. If the experiment is approved it is expected that 1st test beam runs could take place in 2005 or 6 at the earliest. (There is always talk of

an earlier time for a test run.) However we would like to test at least one "acceptable" cavity cryomodule at the A0 injector with beam by or before 2003. The focus of the effort since 98 has been the cavity and cryomodule. Major effort and commitment in the areas of cryogenics and RF power will be differed as long as possible or till experiment approval.

Charge Questions

Is the overall approach likely to lead to successful cavity development in the required time? What changes in approach would be helpful? Is the overall technical status at this date appropriate? Is the funding and effort level consistent with the schedule and effective R&D progress?

Is the cavity shape design sufficiently understood and optimized in order to be considered final for prototype fabrication? Should we be worried about input coupler coupling and HOM's ?
Are there modifications to be considered?

How soon would it be appropriate to prepare and submit a bid package for fabrication of 3-4 prototype cavities? What questions should be addressed prior to bid request?

Comment on over all cavity/cryostat system design choices, open options and possible modifications.

What are the most urgent R&D or infrastructure issues to be addressed?

Comment on the potential for and benefit of a broader SCRF R&D program at Fermilab in collaboration with other laboratories and on other projects (For instance 3.9GHz acceleration mode cavities for TTF Injector).

Comment on the potential for and benefit of a broader participation of other institutions in the FNAL SCRF program on deflecting mode cavities.